

# YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

1947 Galileo Court, Suite 103; Davis, CA 95618

## Stationary Natural Gas Fired Internal Combustion Engine Emission Evaluation

ATC # C-10-58  
PTO # P-5-11 (reserved)  
SIC Code # 4953  
UTM E \_\_\_\_\_ km  
UTM N \_\_\_\_\_ km

ENGINEER: Courtney Graham

FACILITY NAME: Recology Hay Road

LOCATION: The equipment will be located at 6426 Hay Road in Vacaville. The equipment will not be located within 1,000 feet of a K-12 school and is not subject to the requirements of H&S 42301.6.

**FACILITY DESCRIPTION:** Recology Hay Road (formerly Norcal Waste Systems Hay Road Landfill, Inc.) operates the Municipal Solid Waste (MSW) landfill located at 6426 Hay Road in Vacaville, CA. The current design capacity for the landfill is 35.6 million cubic yards (17.0 million megagrams). The majority of the landfilling process consists of placing waste into active waste management cells that are covered daily with soil or chipped greenwaste. Once a cell is filled to capacity, it is covered with a final layer of soil and the waste is allowed to degrade naturally. In general, as the waste decomposes it produces landfill gases that contain large amounts of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>), as well as, relatively small amounts of non-methane organic compounds (NMOC) and hazardous air pollutants (HAP's). Overtime these gases migrate upward through the waste cells and are emitted as fugitive emissions. Conservatively, this evaluation assumes that all of the NMOC emissions are volatile organic compounds (VOC's).

**PROPOSAL:** The applicant is proposing to install a new propane fired engine to serve as a tipper for pot-bellied trucks. This evaluation will serve as both the District emission evaluation and the Title V Statement of Basis. This evaluation reflects only the requirements pertaining to C-10-58. Emission units that are not affected by this proposal were evaluated in the original (or any subsequent) Title V Statement of Basis and will not be evaluated here.

**PROCESS:** Limited use propane-fired IC engine powering a truck tipper.

**FLOW DIAGRAM:** None required.

**IDENTIFICATION NUMBER:** P-5-11

**EQUIPMENT:** 170 BHP propane fired Kem Equipment IC engine, Model No. 8.1L, Serial No. tbd, Model Year 2010

**CONTROL EQUIPMENT:** Automatic air/fuel ratio controller and catalytic converter

### APPLICATION DATA:

<u>Operational Data</u>	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
Max. Daily Operation =	24 hours/day	Tdh	Applicant
Max. 1st Quarter Operation =	1230 hours/quarter	T1h	Applicant
Max. 2nd Quarter Operation =	1230 hours/quarter	T2h	Applicant
Max. 3rd Quarter Operation =	1230 hours/quarter	T3h	Applicant
Max. 4th Quarter Operation =	1230 hours/quarter	T4h	Applicant
Max. Yearly Operation =	4920 hours/year	Tyh	Applicant

<u>Engine Data</u>	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
Max. Continuous Engine HP =	170 BHP	HP	Applicant
Exhaust Flow Rate =	808 ACFM	EF	Applicant
Exhaust Temperature =	1,710 Degrees Rankine (F+460)	ET	Applicant
Exhaust O <sub>2</sub> =	0.3 %	EO	Applicant
Design Type =	4 cycle (stroke)	-	Applicant
Fuel Consumption	16.4 gallons/hour	FC	Applicant

<u>Fuel Usage Data</u>	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
Daily Fuel Use =	394 gallons	TD	Tdh * FC
1st Quarter Fuel Use =	20,172 gallons	T1	T1h * FC
2nd Quarter Fuel Use =	20,172 gallons	T2	T2h * FC
3rd Quarter Fuel Use =	20,172 gallons	T3	T3h * FC
4th Quarter Fuel Use =	20,172 gallons	T4	T4h * FC
Yearly Fuel Use =	80,688 gallons	TY	Tyh * FC

**ASSUMPTIONS:**

<u>Misc. Data</u>	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
Exhaust Moisture =	10.0 %	EM	District
Standard Temperature =	528 Degrees Rankine	ST	District
Molar Volume =	385 SCF/mole	MV	District
Molecular Weight VOC =	16 lb/mole	MWvoc	District
Molecular Weight CO =	28 lb/mole	MWco	District
Molecular Weight NO2 =	46 lb/mole	MWno2	District
power conversion =	1.34 kW/hp	KW	District
weight conversion =	453.6 g/lb	WT	District
Higher Heating Value =	0.0905 MMBTU/gallon	HHV	District
Propane Conversion factor =	35.78 CF/gallon propane	PF	Holt of California *

\* Conversion factor provided by Holt of California on (7/24/2001).

**EMISSION FACTORS:**

	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
VOC* =	0.080 g/KW-hr	Efvoc	Applicant
CO =	2.113 g/KW-hr	Efco	Applicant
NOx =	0.290 g/KW-hr	Efnox	Applicant
SOx =	0.058 g/bhp-hr	EFsox	CAPCOA (5/19/95)
TSP/PM10 =	0.043 g/bhp-hr	EFpm	CAPCOA (5/19/95)

\* Measured as methane.

**Concentrations at 15% O2:**

VOC =	72 ppm	Efvoc	Applicant*
CO =	1,083 ppm	Efco	Applicant*
NOx =	90 ppm	Efnox	Applicant*

\* Efvocppm = (lb/day)/60 min/24 hr/scfm/MW\*MV\*1e6

**CALCULATIONS:**

**1. Determine Standard Exhaust Flow:**

Dry Standard Exhaust Flow Rate, **SCFM** = EF \* ST / ET \* (100%-EM) = 224.5 dscfm

**2. Determine Exhaust Concentrations at Actual Flow Conditions:**

	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
VOC =	250.5 ppmv @ actual flow rate	EFvoc	EFvoc@15*(20.9-EO)/(20.9-15)
CO =	3,781.4 ppmv @ actual flow rate	EFco	EFco@15*(20.9-EO)/(20.9-15)
NOx =	315.9 ppmv @ actual flow rate	EFnox	EFnox@15*(20.9-EO)/(20.9-15)

**3. Determine Yearly MMBtu combusted in Engine for Toxics:**

MMBTU/year = Ty \* HHV = 7302 MMBTU/year

**EMISSION CALCULATIONS:**

**1. Determine the Combustion Emissions:**

**VOC Combustion Emissions:**

Max. Daily VOC Emissions = Tdh * hp * Efvoc * KW / (WT) =	1.0 lb/day
1st Quarter VOC Emissions = T1h * hp * Efvoc * KW / (WT) =	49 lb/quarter
2nd Quarter VOC Emissions = T2h * hp * Efvoc * KW / (WT) =	49 lb/quarter
3rd Quarter VOC Emissions = T3h * hp * Efvoc * KW / (WT) =	49 lb/quarter
4th Quarter VOC Emissions = T4h * hp * Efvoc * KW / (WT) =	49 lb/quarter
Max. Yearly VOC Emissions = Tyh * hp * Efvoc * KW / (WT) * (1 ton/2,000 lb) =	0.10 tons/year

**CO Combustion Emissions:**

Max. Daily CO Emissions = $T_{dh} * hp * E_{fco} * KW / (WT) =$	25.5 lb/day
1st Quarter CO Emissions = $T_{1h} * hp * E_{fco} * KW / (WT) =$	1,305 lb/quarter
2nd Quarter CO Emissions = $T_{2h} * hp * E_{fco} * KW / (WT) =$	1,305 lb/quarter
3rd Quarter CO Emissions = $T_{3h} * hp * E_{fco} * KW / (WT) =$	1,305 lb/quarter
4th Quarter CO Emissions = $T_{4h} * hp * E_{fco} * KW / (WT) =$	1,305 lb/quarter
Max. Yearly CO Emissions = $T_{yh} * hp * E_{fco} * KW / (WT) * (1 \text{ ton}/2,000 \text{ lb}) =$	2.61 tons/year

**NOx Combustion Emissions:**

Max. Daily NOx Emissions = $T_{dh} * hp * E_{fnox} * KW / (WT) =$	3.5 lb/day
1st Quarter NOx Emissions = $T_{1h} * hp * E_{fnox} * KW / (WT) =$	179 lb/quarter
2nd Quarter NOx Emissions = $T_{2h} * hp * E_{fnox} * KW / (WT) =$	179 lb/quarter
3rd Quarter NOx Emissions = $T_{3h} * hp * E_{fnox} * KW / (WT) =$	179 lb/quarter
4th Quarter NOx Emissions = $T_{4h} * hp * E_{fnox} * KW / (WT) =$	179 lb/quarter
Max. Yearly NOx Emissions = $T_{yh} * hp * E_{fnox} * KW / (WT) * (1 \text{ ton}/2,000 \text{ lb}) =$	0.36 tons/year

**SOx Combustion Emissions:**

Max. Daily SOx Emissions = $E_{fsox} * HP * (24 \text{ hr/day}) * (1 \text{ lb}/453.6 \text{ g}) =$	0.5 lb/day
1st Quarter SOx Emissions = Max. Daily * (90 days/quarter) =	47 lb/quarter
2nd Quarter SOx Emissions = Max. Daily * (91 days/quarter) =	47 lb/quarter
3rd Quarter SOx Emissions = Max. Daily * (92 days/quarter) =	48 lb/quarter
4th Quarter SOx Emissions = Max. Daily * (92 days/quarter) =	48 lb/quarter
Max. Yearly SOx Emissions = Max. Daily * (365 days/year) * (1 ton/2,000 lb) =	0.10 tons/year

**TSP/PM10 Combustion Emissions:**

Max. Daily TSP/PM10 Emissions = $E_{fpm} * HP * (24 \text{ hr/day}) * (1 \text{ lb}/453.6 \text{ g}) =$	0.4 lb/day
1st Quarter TSP/PM10 Emissions = Max. Daily * (90 days/quarter) =	35 lb/quarter
2nd Quarter TSP/PM10 Emissions = Max. Daily * (91 days/quarter) =	35 lb/quarter
3rd Quarter TSP/PM10 Emissions = Max. Daily * (92 days/quarter) =	36 lb/quarter
4th Quarter TSP/PM10 Emissions = Max. Daily * (92 days/quarter) =	36 lb/quarter
Max. Yearly TSP/PM10 Emissions = Max. Daily * (365 days/year) * (1 ton/2,000 lb) =	0.07 tons/year

**2. Determine Particulate Matter Emission Concentration:**

$$PM \text{ Conc.} = (PM \text{ lb/day}) * (7,000 \text{ grains/lb}) * (1 \text{ day}/1,440 \text{ min}) / SCFM = 0.008 \text{ gr/dscf}$$

**3. Determine SOx Emission Concentration:**

$$SOx \% = (SOx \text{ lb/day}) * MV * (lb\text{-mol}/64 \text{ lb}) * (1 \text{ day}/1,440 \text{ min}) / SCFM * 100\% = 0.001 \%$$

**RULE & REGULATION COMPLIANCE EVALUATION:****District Rule 2.3-Ringelmann**

The version of the rule used in this evaluation is the rule adopted on October 1, 1971, and is part of the California State Implementation Plan (SIP). The source is currently in compliance with the requirements of the rule.

**1. Requirement:** The Permit Holder shall not discharge into the atmosphere from any single source of emission whatsoever, any air contaminant for a period or periods aggregating more than three (3) minutes in any one (1) hour which is:

a. As dark or darker in shade as that designated as No. 2 on the Ringelmann Chart as published by the United States Bureau of Mines; or

b. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection a. of this condition. [District Rule 2.3]

**Streamlined Demonstration:** The requirements of the rule can be streamlined by a Rule 3.4, New Source Review condition

**Permit condition:** The Permit Holder shall not discharge into the atmosphere any air contaminant for a period or periods aggregating more than 3 minutes in any one hour which is:

a. As dark or darker in shade than No. 1 on the Ringelmann Chart; or

b. Greater than 20% opacity. [District Rule 3.4]

**District Rule 2.5-Nuisance**

The operation is expected to comply with the rule requirement of no discharge which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or the public. A condition will not be placed on the ATC, but will be added to the PTO upon implementation.

**District Rule 2.11-Particulate Matter**

This rule was updated 1/13/10, however the rule has not yet been approved as part of the SIP, therefore the previous (SIP-approved) version was evaluated here.

**1. Requirement:**

<u>Emission Rate (gr/dscf)</u>	<u>Allowable Rate (gr/dscf)</u>	<u>Compliance</u>
0.008	0.3	Yes

**Streamlined Demonstration:** The above emission rate was calculated using the daily pm10 emission limit for Rule 3.4, New Source Review. The Rule 3.4 requirement of 0.008 gr/dscf will subsume the rule 2.11 requirement of 0.3 gr/dscf.

**Streamlined Condition:** PM10 emissions from the process shall not exceed 0.4 lb/day, 35 lb/1st calendar quarter, 35 lb/2nd calendar quarter, 36 lb/3rd calendar quarter, 36 lb/4th calendar quarter, and 0.07 tons/year. [District Rules 2.11 and 3.4/C-10-65]

**District Rule 2.12, Section A-Sulfur Compounds**

This rule was updated 1/13/10, however the rule has not yet been approved as part of the SIP, therefore the previous (SIP-approved) version was evaluated here.

**1. Requirement:**

<u>Emission Rate (% SOx as SO2)</u>	<u>Allowable Rate (% SOx as SO2)</u>	<u>Compliance</u>
0.001	0.2	Yes

**Streamlined Demonstration:** The above emission rate was calculated using the daily SOx emission limit for Rule 3.4, New Source Review. The Rule 3.4 requirement of 0.001% will subsume the rule 2.11 requirement of 0.2%.

**Streamlined Condition:** SOx emissions from the process shall not exceed 0.5 lb/day, 47 lb/1st calendar quarter, 47 lb/2nd calendar quarter, 48 lb/3rd calendar quarter, 48 lb/4th calendar quarter, and 0.10 tons/year. [District Rules 2.11 and 3.4/C-10-65]

**District Rule 2.32-Stationary Internal Combustion Engines**

This rule was adopted 10/10/01 and is included in the SIP. As shown below, the source is in compliance with the requirements of the rule.

**1. Requirement:** The engine must comply with 90 ppm Nox and 2,000 ppm CO at 15% O2. (section 301.4)

**Streamlined Demonstration:** The applicant has proposed lower emission rates in order to comply with the provisions of Rule 3.4, New Source Review.

**Streamlined Condition:** Emission rates shall not exceed the following:  
a. VOC (measured as methane) - 72 ppmv @ 15% O2;  
b. CO - 1,083 ppmv @ 15% O2; and  
c. NOx (as NO2) - 90 ppmv @ 15% O2. [District Rules 2.32 and 3.4]

**2. Requirement:** The operator shall submit an engine operator inspection plan which includes basic engine information, control equipment, location of engine, inspection procedures, and maintenance procedures. (section 302)

There is no permit condition required, since the operator has already complied with this provision by providing information with the application.

**3. Requirement:** A non-resettable, totalizing fuel flow meter shall be installed and utilized to measure the quantity of propane combusted in the engine. [District Rule 2.32, §304.1]

**4. Requirement:** the engine shall be source tested at least once every 24 months for NOx and CO using the test methods approved in the rule. (section 303 )

**Streamlined Demonstration:** The applicant is required to source test more frequently to comply with the provisions of Rule 3.4, New Source Review.

**Streamlined Condition:** The Permit Holder shall perform a source test within 45 days of the unit's initial startup and at least once every 12 months thereafter to demonstrate compliance with VOC, CO and NOx emission limits. [District Rules 2.32 and 3.4]

**5. Requirement:** The Permit Holder shall monitor and record the cumulative quarterly and annual propane fuel usage from the totalizing meter. The records shall be updated quarterly and made available to the District upon request. Historic annual data for the two (2) previous calendar years shall be kept and made available to the District upon request.

**Streamlined Demonstration:** The district Rule 3.8 recordkeeping requirement of 5 years is more stringent than the Rule 2.32 requirement of 2 years. That portion of the requirement will be subsumed by the condition below.

**Streamlined Condition:**

The Permit Holder shall maintain all records on site for a period of five (5) years from the date of entry and these records shall be made readily available to District personnel upon request. [District Rule 3.8, §302.6(b)/C-10-58]

**District Rule 3.1-General Permit Requirements**

This rule was adopted 2/23/94 and is included in the SIP. The source is in compliance with the requirements of the rule.

**1. Requirement:**

No person shall build, erect, alter, or replace any facility, article, machine, equipment, or other contrivance, the use of which may cause the issuance of air contaminants, or the use of which may eliminate or reduce or control the issuance of air contaminants, without first obtaining an authorization to construct from the Air Pollution Control Officer (APCO) as specified in Section 401 of District Rule 3.1. [District Rule 3.1, §301.1]

**2. Requirement:**

No person shall operate any facility, article, machine, equipment, or other contrivance, for which an authorization to construct is required by District Rules and Regulations without first obtaining a written permit from the APCO. [District Rule 3.1, §302.1]

**3. Requirement:**

No person shall operate any facility, article, machine, equipment, or other contrivance, the use of which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants, without obtaining a permit from the APCO or the Hearing Board. [District Rule 3.1, §302.2]

**4. Requirement:**

The owner or operator of any facility, article, machine, equipment, or other contrivance for which a permit to operate is in effect shall notify the District office whenever a breakdown, malfunction, or operational upset condition exists which would tend to increase emissions of air pollutants or whenever any operating condition contrary to any provision of the permit to operate exists. Such notice shall be given to the District no later than four hours after occurrence during regular workday hours or no later than two hours of the District workday following an occurrence not during regular District workday hours. The notice shall provide the District information as to causes and corrective action being taken, with a schedule for return to required operating conditions. [District Rule 3.1, §405.3]

**District Rule 3.4-New Source Review**

The source has satisfied the provisions of NSR and the applicable requirements are contained in ATC C-10-58. The NSR requirements are shown below:

**PROPOSED EMISSION SUMMARY FOR NEW OR MODIFIED PERMIT**

	<u>Daily</u>	<u>Yearly</u>	
VOC	1.0 lb	0.10 tons	Use for annual billing
CO	25.5 lb	2.61 tons	Use for annual billing
NOx	3.5 lb	0.36 tons	Use for annual billing
SOx	0.5 lb	0.10 tons	Use for annual billing
PM10	0.4 lb	0.07 tons	Use for annual billing

	<u>Quarterly</u>			
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	49	49	49	49
CO (lb)	1,305	1,305	1,305	1,305
NOx (lb)	179	179	179	179
SOx (lb)	47	47	48	48
PM10 (lb)	35	35	36	36

**Previous quarterly potential to emit for modified permit\***

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	0	0	0	0
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

\* This is a new emission unit, therefore the previous potential to emit (PTE) is zero.

**Historic potential emissions for modified permit\***

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	0	0	0	0
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

\* This is a new emission unit, therefore the historical PTE is zero.

**BACT**

<u>Pollutant</u>	<u>Trigger (lb/day)</u>	<u>Proposed (lb/day)</u>	<u>Quarterly Increase</u>	<u>BACT</u>
VOC	10	1.0	Yes	No
CO	250	25.5	Yes	No
NOx	10	3.5	Yes	No
SOx	80	0.5	Yes	No
PM10	80	0.4	Yes	No

**OFFSETS**

**Quarterly permitted emissions for other permits at the stationary source**

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	24,025	24,220	24,415	24,415
CO (lb)	19,699	19,918	20,137	20,137
NOx (lb)	4,925	4,979	5,034	5,034
SOx (lb)	13,600	13,600	13,600	13,600
PM10 (lb)	2,057	2,075	2,094	2,094

\*See attached facility PTE sheet

**Quarterly permitted emissions for the stationary source including proposed emissions**

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	24,075	24,269	24,464	24,464
CO (lb)	21,004	21,223	21,442	21,442
NOx (lb)	5,104	5,159	5,213	5,213
SOx (lb)	13,647	13,647	13,648	13,648
PM10 (lb)	2,092	2,110	2,130	2,130

**Offset triggers**

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	7,500	7,500	7,500	7,500
CO (lb)	49,500	49,500	49,500	49,500
NOx (lb)	7,500	7,500	7,500	7,500
SOx (lb)	13,650	13,650	13,650	13,650
PM10 (lb)	13,650	13,650	13,650	13,650

**Quantity of offsets required\***

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	49	49	49	49
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

\*Per Policy 21, the District considers emissions changes below 50 lbs in any quarter to be zero.

**MAJOR MODIFICATION**

**Facility Total Potential to Emit**

48.65 TPY VOC  
42.58 TPY CO  
10.48 TPY NOx  
27.31 TPY SOx  
4.25 TPY PM10

**Major Source Thresholds**

25 TPY VOC  
100 TPY CO  
25 TPY NOx  
100 TPY SOx  
100 TPY PM10

Last five year emission aggregate

11.51 TPY VOC  
42.58 TPY CO  
10.48 TPY NOx  
14.49 TPY SOx  
3.43 TPY PM10

Major Modification Thresholds

25 TPY VOC  
100 TPY CO  
25 TPY NOx  
40 TPY SOx  
25 TPY PM10

**Result: The proposed modification is not a major modification**

PUBLIC NOTICE

"Increase in historic potential to emit"

49 lb VOC/quarter  
1,305 lb CO/quarter  
179 lb NOx/quarter  
48 lb SOx/quarter  
36 lb PM10/quarter

Exemption level for notification

7,500 lb VOC/quarter  
49,500 lb CO/quarter  
7,500 lb NOx/quarter  
13,650 lb SOx/quarter  
13,650 lb PM10/quarter

**Result: Public notice is not required**

**1. Requirement:**

The VOC emissions from the tipper engine shall not exceed 1.0 lb/day, 49 lb/1st calendar quarter, 49 lb/2nd calendar quarter, 49 lb/3rd calendar quarter, 49 lb/4th calendar quarter, and 0.10 tons/calendar year. [District Rule 3.4/ C-10-58 and 40 CFR 60.4234]

**2. Requirement:**

The CO emissions from the tipper engine shall not exceed 25.5 lb/day, 1,305 lb/1st calendar quarter, 1,305 lb/2nd calendar quarter, 1,305 lb/3rd calendar quarter, 1,305 lb/4th calendar quarter, and 2.61 tons/calendar year. [District Rule 3.4/ C-10-58 and 40 CFR 60.4234]

**3. Requirement:**

The NOx emissions from the tipper engine shall not exceed 3.5 lb/day, 179 lb/1st calendar quarter, 179 lb/2nd calendar quarter, 179 lb/3rd calendar quarter, 179 lb/4th calendar quarter, and 0.36 tons/calendar year. [District Rule 3.4/ C-10-58 and 40 CFR 60.4234]

**4. Requirement:**

The SOx emissions from the tipper engine shall not exceed 0.5 lb/day, 47 lb/1st calendar quarter, 47 lb/2nd calendar quarter, 48 lb/3rd calendar quarter, 48 lb/4th calendar quarter, and 0.10 tons/calendar year. [District Rules 2.11 and 3.4/ C-10-58]

**5. Requirement:**

The PM10 emissions from the tipper engine shall not exceed 0.4 lb/day, 35 lb/1st calendar quarter, 35 lb/2nd calendar quarter, 36 lb/3rd calendar quarter, 36 lb/4th calendar quarter, and 0.07 tons/calendar year. [District Rules 2.11 and 3.4/ C-10-58]

**6. Requirement:**

The amount of propane combusted in the engine shall not exceed 394 gallons/day, 20,172 gallons/1st calendar quarter, 20,172 gallons/2nd calendar quarter, 20,172 gallons/3rd calendar quarter, 20,172 gallons/4th calendar quarter, and 80,688 gallons/year. [District Rule 3.4/ C-10-58]

**7. Requirement:**

Emission rates shall not exceed the following:

- a. VOC (measured as methane) - 72 ppmv @ 15% O<sub>2</sub>;
- b. CO - 1,083 ppmv @ 15% O<sub>2</sub>; and
- c. NOx (as NO<sub>2</sub>) - 90 ppmv @ 15% O<sub>2</sub>. [District Rule 2.32 and District Rule 3.4]

**8. Requirement:**

The Permit Holder shall install and maintain such facilities as are necessary for sampling and testing purposes. The number, size, and location of sampling ports shall be in accordance with Air Resources Board Test Method 1. The location and access to the sampling platform shall be in accordance with the General Industry Safety Orders of the State of California. [District Rule 3.4]

**9. Requirement:**

The Permit Holder shall perform a source test within 45 days of the unit's initial startup and at least once every 12 months thereafter to demonstrate compliance with VOC, CO and NOx emission limits. [District Rule 2.32, §303.2 and District Rule 3.4]

**10. Requirement:**

Source testing shall be conducted using the following test methods:

- a. VOC - EPA Method 18;
- b. CO - EPA Method 10, or CARB Method 100;
- c. NOx (as NO<sub>2</sub>) - EPA Method 7E, or CARB Method 100; and
- d. Stack gas oxygen - EPA Method 3A, or CARB Method 100. [District Rule 2.32, §502 and District Rule 3.4]

**11. Requirement:**

The District must be notified prior to any emissions testing event (source test or screening analysis), and a protocol must be submitted for approval 14 days prior to testing. The results of an emissions testing event shall be submitted to the District within 60 days of the test date. The protocol and report shall be mailed to the attention of the Supervising Air Quality Engineer. [District Rule 3.4]

**District Rule 3.8-Federal Operating Permits**

This rule implements the requirements of Title V of the Federal CAA as amended in 1990 for permits to operate. Title V provides for the establishment of operating permit programs for sources which emit regulated air pollutants, including attainment and non-attainment pollutants.

The source is in compliance with the requirements of this rule. The source currently has one proposed change for which the District is issuing an ATC, which is being processed according to the District's Enhanced NSR guidelines in District Rule 3.4, Section 404.

In accordance with District Rule 3.8, section 409, a significant permit modification requires that the District provide written notice, proposed permit, and District Analysis to the USEPA, Air Resources Board, all interested parties and agencies, and the source. The proposed permit will have a 30 day public review period and a concurrent 45 day regulatory review period.

Upon implementation of the District ATC into a PTO, the source may submit a written request for District action to amend the Title V operating permit pursuant to District Rule 3.8, section 404.1. Since the District ATC has been processed according to enhanced NSR guidelines, upon written request by the source, the District shall incorporate the changes into the Title V permit as an administrative permit amendment pursuant to District Rule 3.8, section 412.1.

**1. Requirement:**

The Permit Holder shall maintain all records on site for a period of five (5) years from the date of entry and these records shall be made readily available to District personnel upon request. [District Rule 3.8, §302.6(b)/C-10-58]

**2. Requirement:**

The permit shall require that the source allow the entry of the District, ARB, or U.S. EPA officials for the purpose of inspection and sampling, including:

- a. Inspection of the stationary source, including equipment, work practices, operations, and emissions-related activity;
- b. Inspection and duplication of records required by the permit to operate; and
- c. Source sampling or other monitoring activities. [District Rule 3.8, §302.10]

**3. Requirement:**

The Permit Holder shall comply with all Title V permit conditions. [District Rule 3.8, §302.11a]

**4. Requirement:**

The permit does not convey property rights or exclusive privilege of any sort. [District Rule 3.8, §302.11b]

**5. Requirement:**

Non-compliance with any permit condition is grounds for permit termination, revocation and reissuance, modification, enforcement action, or denial of permit renewal. [District Rule 3.8, §302.11c]

**6. Requirement:**

The Permit Holder shall not use the "need to halt or reduce a permitted activity in order to maintain compliance" as a defense for non-compliance with any permit condition. [District Rule 3.8, §302.11d]

**7. Requirement:**

A pending permit action or notification of anticipated non-compliance does not stay any permit condition. [District Rule 3.8, §302.11e]

**8. Requirement:**

Within a reasonable time period, the Permit Holder shall furnish any information requested by the APCO, in writing, for the purpose of determining:

- a. Compliance with the permit; or
- b. Whether or not cause exists for a permit or enforcement action. [District Rule 3.8, §302.11f]

**9. Requirement:**

Within two weeks of an emergency event, the owner or operator shall submit to the District a properly signed contemporaneous log or other relevant evidence demonstrating that:

- a. An emergency occurred;
- b. The Permit Holder can identify the cause(s) of the emergency;
- c. The facility was being properly operated at the time of the emergency;
- d. All steps were taken to minimize the emissions resulting from the emergency; and
- e. Within two working days of the emergency event, the Permit Holder provided the District with a description of the emergency and any mitigating or corrective actions taken.

In any enforcement proceeding, the Permit Holder has the burden of proof for establishing that an emergency occurred. [District Rule 3.8, §302.12]

**10. Requirement:**

If any provision, clause, sentence, paragraph, section or part of these conditions for any reason is judged to be unconstitutional or invalid, such judgement shall not affect or invalidate the remainder of these conditions. [District Rule 3.8, §302.13]

**11. Requirement:**

The Responsible Official shall submit a compliance certification to the U.S. EPA and the APCO every twelve (12) months unless required more frequently by an applicable requirement. The twelve (12) month period will begin on January 1 and end on December 31, and will be due by January 31 for the previous reporting year, unless otherwise approved in writing by the District. All compliance reports and other documents required to be submitted to the District by the responsible official shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Upon the issuance of this revised Title V Operating Permit, the Permit Holder shall submit an annual compliance certification to the U.S. EPA and the APCO for the periods between December 1, 2010 and January 1, 2011. This annual compliance certification shall certify compliance with the requirements of Title V Operating Permit F-01059-4, and will be due by April 15, 2011. [District Rule 3.8, §302.14(a)]

**12. Requirement:**

The compliance certification shall identify the basis for each permit term or condition (e.g., specify the emissions limitation, standard, or work practice) and a means of monitoring compliance with the term or condition consistent with Sections 302.5, 302.6, and 302.7 of Rule 3.8. [Rule 3.8 § 302.14b]

**13. Requirement:**

The compliance certification shall include a statement of the compliance status, whether compliance was continuous or intermittent, and method(s) used to determine compliance for the current time period and over the entire reporting period. [Rule 3.8 § 302.14c]

**14. Requirement:**

The compliance certification shall include any additional inspection, monitoring, or entry requirement that may be promulgated pursuant to Sections 114(a) and 504(b) of the Federal Clean Air Act. [Rule 3.8 § 302.14d]

**15. Requirement:**

The Title V permit shall expire five years from the date of issuance. Title V permit expiration terminates the stationary source's right to operate unless a timely and complete Title V permit application for renewal has been submitted. [District Rule 3.8, §302.15]

**16. Requirement:**

An owner or operator shall pay the appropriate Title V permit fees on schedule. If fees are not paid on schedule, the permit is forfeited. Operation without a permit subjects the source to potential enforcement action by the District and the U.S. EPA pursuant to Section 502(a) of the CAA. [District Rule 3.8, §302.16]

**17. Requirement:**

No permit revision shall be required under any approved economic incentives, marketable permits, emissions trading, and other similar programs or processes, for changes that are provided for in the permit. [District Rule 3.8, §302.22]

**18. Requirement:**

An owner or operator shall submit a standard District application for renewal of the Title V permit, no earlier than 18 months and no later than six months before the expiration date of the current permit to operate. [District Rule 3.8, §402.2]

**19. Requirement:**

An owner or operator shall submit a standard District application for each emissions unit affected by a proposed permit revision that qualifies as a significant Title V permit modification. The application shall be submitted after obtaining any required preconstruction permits. Upon request by the APCO, the owner or operator shall submit copies of the latest preconstruction permit for each affected emissions unit. The emissions unit(s) shall not commence operation until the APCO approves the permit revision. [District Rule 3.8, §402.3]

**20. Requirement:**

An owner or operator shall submit a standard District application for each emissions unit affected by the proposed permit revision that qualifies as a minor permit modification. The application shall be submitted after obtaining any required preconstruction permits. The emissions unit(s) shall not commence operation until the APCO approves the permit revision. In the application, the owner or operator shall include the following:

- a. A description of the proposed permit revision, any change in emissions, and additional applicable federal requirements that will apply;
- b. Proposed permit terms and conditions; and
- c. A certification by a responsible official that the permit revision meets criteria for use of minor permit modification procedures and a request that such procedures be used. [District Rule 3.8, §402.4]

**21. Requirement:**

Circumstances that are cause for reopening and revision of a permit include, but are not limited to, the following:

- a. The need to correct a material mistake or inaccurate statement;
- b. The need to revise or revoke a permit to operate to assure compliance with applicable federal requirements;
- c. The need to incorporate any new, revised, or additional applicable federal requirements, if the remaining authorized life of the permit is three (3) years or greater, no later than 18 months after the promulgation of such requirement (where less than three (3) years remain in the authorized life of the permit, the APCO shall incorporate the requirements into the permit to operate upon renewal); or
- d. Additional requirements promulgated pursuant to Title IV as they become applicable to any acid rain unit governed by the permit. [District Rule 3.8, §413.1]

**22. Requirement:**

The Permit Holder shall record maintenance of all monitoring and support information required by any applicable federal requirement, including:

- a. Date, place, and time of sampling;
- b. Operating conditions at the time of sampling;
- c. Date, place, and method of analysis; and
- d. Results of the analysis. [District Rule 3.8, §302.6a]

**23. Requirement:**

The Permit Holder shall retain records of all required monitoring data and support information for a period of at least five years from the date of sample collection, measurement, report, or application. [District Rule 3.8, §302.6b]

**24. Requirement:**

Any deviation from permit requirements, including that attributable to upset conditions (as defined in the permit), shall be promptly reported to the APCO. For the purpose of this condition prompt means as soon as reasonably possible, but no later than 10 days after detection. [District Rule 3.8, §302.7a]

**25. Requirement:**

A semi-annual monitoring report shall be submitted at least once every six (6) consecutive calendar months and shall identify any deviation from permit requirements, including that previously reported to the APCO pursuant to Section 302.7(a) of Rule 3.8. Unless

- a. The first six (6) month monitoring period will begin on January 1 and end on June 30, and the report will be due by July 31 of the reporting year; and
- b. The second six (6) month period will begin on July 1 and end on December 31, and will be due on January 31 of the following calendar year.

Upon the issuance of this revised Title V Operating Permit, the Permit Holder shall submit a semi-annual monitoring report to the U.S. EPA and the APCO for the periods between December 1, 2010 and January 1, 2011. This semi-annual monitoring report shall certify compliance with the requirements of Title V Operating Permit F-01059-4, and will be due by April 15, 2011. [District 3.8, §302.7(b)]

**26. Requirement:**

All reports of deviation from permit requirements shall include the probable cause of the deviation and any preventive or corrective action taken. [District Rule 3.8, §302.7c]

**27. Requirement:**

Each monitoring report shall be accompanied by a written statement from the responsible official that certifies the truth, accuracy, and completeness of the report. [District Rule 3.8, §302.7e]

**District Rule 3.20-Ozone Transport Mitigation**

As documented above, the facility total PTE is above 10 tons per year for VOC or NOx, and therefore the post-project Stationary Source Potential to Emit (SSPE) will be calculated.

**Annual permitted emissions for the stationary source including proposed emissions**

VOC	97,292 lbs
NOx	20,964 lbs

**Annual permitted emissions for equipment which is exempt from Rule 3.4\***

VOC	20 lbs
NOx	271 lbs

**Post-project Stationary Source Potential to Emit (SSPE)**

VOC	97,272 lbs
NOx	20,689 lbs

Because the post-project SSPE is greater than 10 tons (20,000) lbs per year for VOC or NOx, per Section 301.1, calculations shall be performed to determine the quantity of mitigation required, if any.

**Pre-project Stationary Source Potential to Emit (SSPE)**

VOC	97,072 lbs
NOx	19,973 lbs

**Quantity of offsets required by Rule 3.4**

VOC	0 lbs
NOx	0 lbs

**Quantity of Mitigation required by Rule 3.20**

VOC*	200 lbs
NOx	716 lbs

\*As discussed above, per policy 21, emission changes less than 50 lbs per quarter are considered to be zero.

**1. Requirement**

Prior to implementation of this ATC, the Permit Holder shall supply 716 lbs of Nox mitigation credits from within the Yolo Solano AQMD. [District Rule 3.20, District-only requirement - not Federally enforceable]

**NSPS Applicability-40 CFR, Part 60, Subpart JJJJ, Standards of Performance For Stationary Spark Internal Combustion Engines**

This subpart applies to manufacturers, owners and operators of specified stationary spark ignition internal combustion engines. This is an application for an emergency stationary spark ignition engine, 25 > HP < 130, manufactured in 2010/2011. Per §60.4233 the engine is subject to the emissions standards outlined in Table 1. As demonstrated below the engine meets this requirement.

**1. Requirement:**

		Section 60.4234		
	<u>Manufacturers Emission Rate (g/bhp-hr)</u>		<u>Allowable Rate (g/bhp-hr)</u>	<u>Compliance</u>
HC + NOx	2.70		7	Yes
CO	4.40		289	Yes

**Streamlined Demonstration:**

As shown in the calculations section , above, the emission factors used to calculate the daily emission limits are more stringent than the Subpart JJJJ requirement.

**Streamlined conditions:**

The VOC emissions from the tipper engine shall not exceed 1.0 lb/day, 49 lb/1st calendar quarter, 49 lb/2nd calendar quarter, 49 lb/3rd calendar quarter, 49 lb/4th calendar quarter, and 0.10 tons/calendar year. [District Rule 3.4/ C-10-58]

The CO emissions from the tipper engine shall not exceed 25.5 lb/day, 1,305 lb/1st calendar quarter, 1,305 lb/2nd calendar quarter, 1,305 lb/3rd calendar quarter, 1,305 lb/4th calendar quarter, and 2.61 tons/calendar year. [District Rule 3.4/ C-10-58]

The NOx emissions from the tipper engine shall not exceed 3.5 lb/day, 179 lb/1st calendar quarter, 179 lb/2nd calendar quarter, 179 lb/3rd calendar quarter, 179 lb/4th calendar quarter, and 0.36 tons/calendar year. [District Rule 3.4/ C-10-58]

**2. Requirement:**

The Permit Holder shall maintain records of: maintenance for the engine and control device according to the manufacturers emission related instructions, notifications submitted to comply with the subpart, and documentation from the manufacturer that the engine is certified to meet the applicable emission standards. (§60.4243 and §60.4245).

**3. Requirement:**

The air to fuel ratio controller must be maintained and operated appropriately to ensure proper operation of the engine and control device(§60.4243(g)).

**NSPS Applicability-40 CFR, Part 60, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines**

This subpart applies to engines operating at any stationary source. This is an application for a new spark ignition emergency engine with a rating of less than 500 BHP, therefore the engine will comply with this section by meeting the requirements of 40 CFR part 60 JJJJ. Per Section 63.6590, no further requirements apply for such engines under this part.

**District Risk Management Plan and Risk Assessment Guidelines**

As required by the District's RMPRAG Policy, the project's health risk will be reviewed. The review will evaluate the Hazardous Air Pollutant (HAP) emissions. The rich burn engine is equipped with a catalytic convertor which is expected to control both the HAPs and the criteria pollutant emissions. The District estimates that the control efficiency for HAPs will be at least 80% (equivalent to the control efficiency for CO).

Estimated Control Efficiency = 80%

Pollutants	Uncontrolled Emission Factor * (lb/MMBtu)	Controlled Yearly Emissions ** (lb/year)	Screening Level (lb/year)	Less Than Screening
1,2-Dichloroethane	1.13E-05	0.0165	9.70	Yes
1,3-Butadiene	6.63E-04	0.9683	1.10	Yes
Acetaldehyde	2.79E-03	4.0747	72.0	Yes
Acrolein	2.63E-03	3.8410	3.90	Yes
Benzene	1.58E-03	2.3075	6.70	Yes
Carbon tetrachloride	1.77E-05	0.0259	4.60	Yes
Chlorobenzene	1.29E-05	0.0188	13,500	Yes
Chloroform	1.37E-05	0.0200	36.0	Yes
Ethylbenzene	2.48E-05	0.0362	193,000	Yes
Ethylene dibromide	2.13E-05	0.0311	2.70	Yes
Formaldehyde	2.05E-02	29.9393	33.0	Yes
Methyl alcohol (methanol)	3.06E-03	4.4690	120,000	Yes
Methylene chloride	4.12E-05	0.0602	190.0	Yes

PAH, Unspeciated ***	4.39E-05	0.0641	0.043	No
PAH, Benzo(a)pyrene	0.00E+00	0.0000	0.043	Yes
PAH, Naphthalene ***	9.71E-05	0.1418	270.0	Yes
Styrene	1.19E-05	0.0174	135,000	Yes
Toluene	5.58E-04	0.8149	38,600	Yes
Vinyl chloride	7.18E-06	0.0105	2.50	Yes
Xylenes	1.95E-04	0.2848	57,900	Yes

\* Uncontrolled HAP emission factors from AP-42, Section 3.2 (07/2000).

\*\* Controlled HAP Emission Calculation: [HAP, lb/yr] = [HAP, lb/MMBtu] \* [MMBtu/yr] \* (100% - CE)

\*\*\* Although not indicated in Table 3.2-3 (HAPs data for rich burn natural gas fired engines) naphthalene is a listed PAH, as indicated in Table 3.3-2 (HAPs data for diesel engines). Therefore, the PAH emission factor has been adjusted so that the emission factor of naphthalene is subtracted from the unspiciated PAH emission factor of Table 3.2-2. Conservatively, the District will assume that the remaining PAH is all benzo(a)pyrene. Benzo(a)pyrene was chosen since it has the highest of any PAH listed in Office of Environmental Health Hazard Assessments (OEHHAs) reference exposure levels (REL) table.

Because the emissions from one Hazardous Air Pollutants (HAPs) was above the prioritization level, a health risk assessment was performed for this project. The dispersion modeling and health risks were evaluated using CARB's Hotspots Analysis Reporting Program (HARP) which accounts for site's specific parameters (e.g. stack height, stack location, meteorological data, etc.). The health risks are summarized below.

## 2. Summary of Health Risk Analysis:

The District modeled the health risks using the site specific data and is using the highest risk values of each receptor type to demonstrate compliance with the RMPRAG requirements. The residential receptor's cancer risk has been modeled over a 70 year period, while the worksite receptor's risk has been modeled over 46 years. The HARP results are summarized below.

Receptor Type	Receptor No.	Acute Hazard Index (unitless)	Chronic Hazard Index (unitless)	Individual Cancer Risk (per million)
Worksite	288	0.000	0.000	0.40
Residential (sensitive receptor)	1106	0.000	0.000	0.04

The acute and chronic hazard index were each calculated to be less than 1.0 and the individual cancer risk was calculated to be less than 1 in a million. Therefore, T-BACT is not triggered.

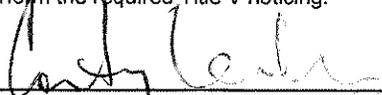
This engine will operate at multiple locations within the source property boundary. To be the most conservative, and protective of public health, the engine was modeled as if it were placed on the northern property boundary (near the facility entrance) because that is the closest location to the nearest residential receptor. Although the cancer risk isopleths show a cancer risk more than 1 in a million at the property boundary, there are no residential receptors there. The residential risk was quantified at the nearest actual receptor (as shown in the attached satellite pictures).

### COMMENTS:

- BACT is not triggered
- NSR public notice is not required
- Offsets are not required
- Rule 3.20 mitigation is required
- Title V public and regulatory notice is required

### RECOMMENDATIONS:

Perform the required Title V noticing.

Engineer: 

Date: 2/3/11

Reviewed by: 

Date: 2/3/11

**YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT**  
1947 Galileo Court, Suite 103, Davis, CA 95618

**New Source Review  
Last Five Year Activity**

Evaluator: Courtney Graham

SIC Code # 4953

Facility Name: Recology Hay Road (formerly Norcal Waste Systems Hay Road Landfill, Inc.)

Date of Initial Determination: 04/23/2002

Date of Previous Determination: 09/17/2009

Date of Current Determination: 02/02/2011

Location: 6426 Hay Road; Vacaville, CA

Process	Issued Permits	Date PTO Issued	ATC	Date ATC Issued	VOC (tpy)	CO (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)
Gasoline Storage and Dispensing	P-28-98	07/27/1998	C-98-25	03/29/1998	0.01	0.00	0.00	0.00	0.00
Limited Use Diesel IC Engine (140 BHP)	P-34-00 <sup>a</sup>	06/21/2000	C-99-34	11/15/1999	-	-	-	-	-
Limited Use Diesel IC Engine (140 BHP)	P-35-00	-	C-99-33	11/16/1999	0.08	2.68	1.32	0.05	0.04
Limited Use Diesel fired IC Engine (250 BHP)	P-36-00	06/21/2000	C-99-25	11/16/1999	0.32	13.30	6.56	0.05	0.89
Emergency Diesel IC Engine (80 BHP)	P-37-00	06/21/2000	C-99-24	11/15/1999	0.02	0.05	0.25	0.02	0.02
Limited Use Diesel fired IC Engine (115 B HP)	P-24-00 <sup>a</sup>	06/21/2000	C-00-08	03/28/2000	-	-	-	-	-
Contaminated Soil Usage	P-64-00	12/15/2000	C-99-134	06/27/2000	13.00	0.00	0.00	0.00	0.82
Fugitive Landfill Gas Emissions	P-85-06	06/07/2007	C-05-88	03/02/2007	11.40	0.00	0.00	0.00	0.00
Emergency IC Engine (147 BHP)	P-86-06	06/07/2007	C-06-119	03/02/2007	0.01	0.03	0.13	0.01	0.00
Fugitive Landfill Gas Emissions <sup>d</sup>	P-85-06(a1)	05/12/2009	C-08-41	12/12/2008	24.13	0.00	0.00	0.00	0.00
Fugitive Landfill Gas Emissions	P-85-06(a2)	-	C-10-34 <sup>b</sup>	PENDING	0.00	39.95	9.99	14.39	3.36
Non Hazardous liquid waste			C-10-42	12/06/2010	0.00	0.00	0.00	0.00	0.00
Propane IC engine powering a tipper			C-10-58	pending	0.10	2.61	0.36	0.10	0.07
<b>TOTAL<sup>c</sup></b>					<b>11.51</b>	<b>42.58</b>	<b>10.48</b>	<b>14.49</b>	<b>3.43</b>

<sup>a</sup> Administrative permit holder name change from "Norcal Waste Systems Hay Road Landfill, Inc." to "Jepson Prairie Organics Compost" processed on 09/22/2006. The emissions from these permits are no longer associated with Norcal Waste's operation.

<sup>b</sup> As proposed, ATC C-10-34 modifies PTO P-85-06(a1) and will supersede ATC C-10-07.

<sup>c</sup> All decreases in PTE are treated as zero net change and not included in the Total 5-Year Aggregate summation.

<sup>d</sup> The VOC emissions change associated with this permit was due to a calculational change required by EPA, therefore, this is not a creditable increase.

**COMMENTS:** These permits are sorted by the ATC issuance date. According to Rule 3.4, Section 221, a major modification is calculated based on all creditable increases and decreases from the source over the period of five consecutive years before the application, including the calendar year of the most recent application. The applicable period ranges from February 2006 to the present date.

Engineer: \_\_\_\_\_

Date: 2/3/11

Reviewed by: \_\_\_\_\_

Date: 2/3/11

**YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT**  
1947 Galileo Court, Suite 103, Davis, CA 95618

**New Source Review**  
**Quarterly Potential To Emit Determination**  
NSR Version 08/13/1998

*Evaluation to be used on existing permits to obtain their quarterly PTE.*

Engineer: Courtney Graham

SIC Code # 4953

Facility Name: Recology Hay Road (formerly Norcal Waste Systems Hay Road Landfill, Inc.)

Location: 6428 Hay Road, Vacaville, CA 95687

Date of Initial Quarterly PTE Determination: 4/23/2002

Date of Previous Quarterly PTE Determination: 01/28/2010

Date of Current Quarterly PTE Determination: 02/01/2011

PTO's

AIC's

C-10-58

CURRENT APPLICATIONS:

Process Description	Current Permits	VOC Emissions				CO Emissions				NOx Emissions				SOx Emissions				PM10 Emissions								
		QTR 1 (lbs)	QTR 2 (lbs)	QTR 3 (lbs)	QTR 4 (lbs)	Annual (TPY)	QTR 1 (lbs)	QTR 2 (lbs)	QTR 3 (lbs)	QTR 4 (lbs)	Annual (TPY)	QTR 1 (lbs)	QTR 2 (lbs)	QTR 3 (lbs)	QTR 4 (lbs)	Annual (TPY)	QTR 1 (lbs)	QTR 2 (lbs)	QTR 3 (lbs)	QTR 4 (lbs)	Annual (TPY)					
Propane IC Engine	C-10-58	49	49	49	49	0.1	1305	1305	1305	1305	2.61	179	179	179	179	0.36	47	47	47	47	186	35	35	35	35	0.07
Gasoline Storage & Dispensing; Non-Retail	P-28-98	5	5	5	5	0.01	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00
Petroleum Contaminated Soil Operations	P-64-00	6,500	6,500	6,500	6,500	13.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	402	402	402	402	0.82
Non-hazardous liquid waste	C-10-42	1	1	1	1	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00
Landfill Fugitive Emissions	P-85-06(a1)	18,988	17,147	17,335	17,335	34.39	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00
	C-10-34	17,520	17,714	17,909	17,909	35.53	19,699	19,918	20,137	20,137	39.95	4,925	4,990	5,034	5,034	9.99	13,600	13,600	13,600	13,600	27.20	1,655	1,673	1,692	1,692	3.36
PRE-PROJECT SSPE		24,026	24,220	24,415	24,415	48.54	19,699	19,918	20,137	20,137	39.95	4,925	4,990	5,034	5,034	9.99	13,600	13,600	13,600	13,600	27.20	1,655	1,673	1,692	1,692	3.36
POST-PROJECT SSPE		24,075	24,269	24,464	24,464	48.84	21,004	21,223	21,442	21,442	42.56	5,104	5,159	5,213	5,213	10.35	13,612	13,612	13,612	13,612	27.30	2,063	2,081	2,099	2,099	4.18
Emergency IC Engine (150 BHP)	P-85-06	20	20	20	20	0.01	54	54	54	54	0.06	271	271	271	271	0.14	13,612	13,612	13,612	13,612	27.31	2,063	2,081	2,099	2,099	4.25
PRE-PROJECT TOTAL PTE		24,046	24,240	24,435	24,435	48.55	19,753	19,972	20,191	20,191	39.97	5,186	5,251	5,305	5,305	10.12	13,612	13,612	13,612	13,612	27.31	2,063	2,081	2,099	2,099	4.18
POST-PROJECT TOTAL PTE		24,095	24,289	24,484	24,484	48.85	21,058	21,277	21,496	21,496	42.58	5,375	5,430	5,484	5,484	10.48	13,650	13,650	13,650	13,650	27.31	2,098	2,116	2,135	2,135	4.25

<sup>1</sup> Per the requirements of Rule 3.20, the facility's pre- and post-project Stationary Source Potential to Emit (SSPE) calculations do not include any emissions from permitted emergency equipment.

<sup>2</sup> The facility's pre- and post-project Total Potential to Emit (PTE) calculations include all permitted equipment operating at the site.

**Post-Project Stationary Source Potential to Emit (SSPE)**

	Yearly (lbs/year)			
	Quarter #1	Quarter #2	Quarter #3	Quarter #4
VOC	24,075	24,269	24,464	24,464
CO	21,004	21,223	21,442	21,442
NOx	5,104	5,159	5,213	5,213
SOx	13,647	13,647	13,648	13,648
PM10	2,092	2,110	2,130	2,130

**MITIGATION THRESHOLDS**

	Yearly (lbs/year)	Quarterly (lbs/quarter)			
		Quarter #1	Quarter #2	Quarter #3	Quarter #4
VOC	20,000	49,500	49,500	49,500	49,500
NOx	20,000	13,650	13,650	13,650	13,650
SOx	-	-	-	-	-
PM10	-	-	-	-	-

**SSPE Comparison to Rule 3.20 Triggers**

	Annual	Quarterly			
		Quarter #1	Quarter #2	Quarter #3	Quarter #4
VOC	Above	Above	Above	Above	Above
CO	-	Below	Below	Below	Below
NOx	Below	Above	Above	Above	Above
SOx	-	Below	Below	Below	Below
PM10	-	Below	Below	Below	Below

**Post-Project Total Quarterly Potential to Emit (PTE)**

	Yearly (tons)			
	Quarter #1	Quarter #2	Quarter #3	Quarter #4
VOC	24,095	24,289	24,484	24,484
CO	21,058	21,277	21,496	21,496
NOx	5,375	5,430	5,484	5,484
SOx	13,659	13,659	13,660	13,660
PM10	2,098	2,116	2,135	2,135

**OFFSET THRESHOLDS**

	Yearly (lbs/year)	Quarterly (lbs/quarter)			
		Quarter #1	Quarter #2	Quarter #3	Quarter #4
VOC	7,500	49,500	49,500	49,500	49,500
NOx	7,500	13,650	13,650	13,650	13,650
SOx	-	-	-	-	-
PM10	-	-	-	-	-

**PTE Comparison to NSR Triggers**

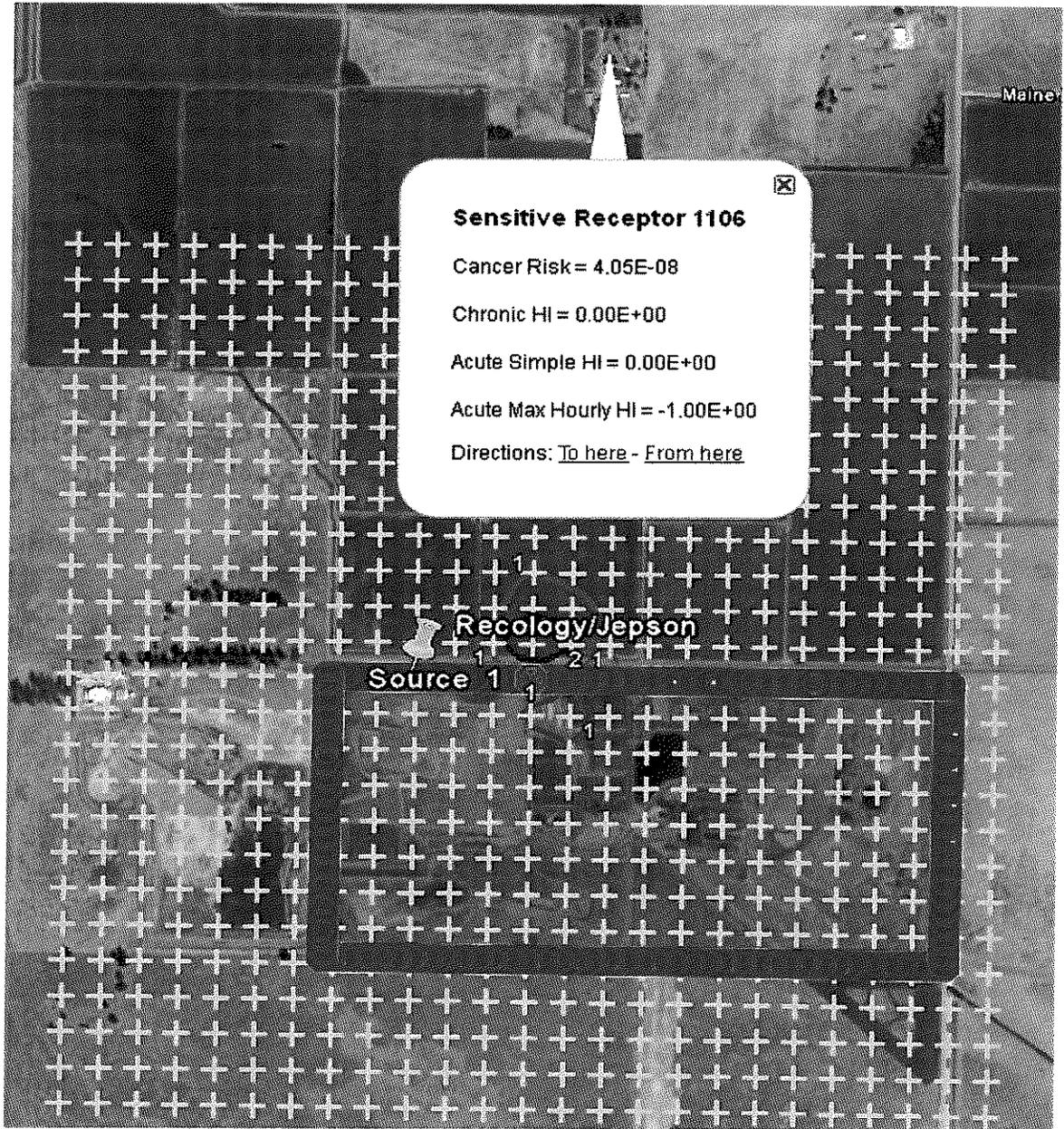
	Annual	Quarterly			
		Quarter #1	Quarter #2	Quarter #3	Quarter #4
VOC	Above	Above	Above	Above	Above
CO	Below	Below	Below	Below	Below
NOx	Below	Above	Above	Above	Above
SOx	-	Below	Below	Below	Below
PM10	-	Below	Below	Below	Below

COMMENTS: This quarterly PTE evaluation was updated for ATC C-10-42.

Engineer: *[Signature]*  
Reviewed by: *[Signature]*

Date: 2/3/11

Date: 2/3/11



sensitive receptor C-10-58  
nearest residence



Cancer risk isopleths C-10-58

FILE: F:\ENGINEER\Software\HARP\HARP\Projects\2010\C1058\worksiterisk.txt

## EXCEPTION REPORT

(there have been no changes or exceptions)

## RECEPTORS WITH HIGHEST CANCER RISK

REC	TYPE	CANCER	CHRONIC	ACUTE	UTME	UTMN	ZONE
288	GRID	4.01E-07	0.00E+00	0.00E+00	601778	4241472	10
1000	BOUNDARY	3.32E-07	0.00E+00	0.00E+00	601804	4241372	10
999	BOUNDARY	2.95E-07	0.00E+00	0.00E+00	601794	4241372	10
1001	BOUNDARY	2.91E-07	0.00E+00	0.00E+00	601814	4241372	10
1002	BOUNDARY	2.42E-07	0.00E+00	0.00E+00	601824	4241372	10
289	GRID	2.33E-07	0.00E+00	0.00E+00	601878	4241472	10
1003	BOUNDARY	1.99E-07	0.00E+00	0.00E+00	601834	4241372	10
263	GRID	1.70E-07	0.00E+00	0.00E+00	601778	4241572	10
1004	BOUNDARY	1.65E-07	0.00E+00	0.00E+00	601844	4241372	10
339	GRID	1.60E-07	0.00E+00	0.00E+00	601878	4241272	10
264	GRID	1.39E-07	0.00E+00	0.00E+00	601878	4241572	10
1005	BOUNDARY	1.39E-07	0.00E+00	0.00E+00	601854	4241372	10
287	GRID	1.35E-07	0.00E+00	0.00E+00	601678	4241472	10
338	GRID	1.30E-07	0.00E+00	0.00E+00	601778	4241272	10
1006	BOUNDARY	1.18E-07	0.00E+00	0.00E+00	601864	4241372	10

## RECEPTORS WITH HIGHEST CHRONIC HI

REC	TYPE	CANCER	CHRONIC	ACUTE	UTME	UTMN	ZONE
288	GRID	4.01E-07	0.00E+00	0.00E+00	601778	4241472	10
1000	BOUNDARY	3.32E-07	0.00E+00	0.00E+00	601804	4241372	10
999	BOUNDARY	2.95E-07	0.00E+00	0.00E+00	601794	4241372	10
1001	BOUNDARY	2.91E-07	0.00E+00	0.00E+00	601814	4241372	10
1002	BOUNDARY	2.42E-07	0.00E+00	0.00E+00	601824	4241372	10
289	GRID	2.33E-07	0.00E+00	0.00E+00	601878	4241472	10
1003	BOUNDARY	1.99E-07	0.00E+00	0.00E+00	601834	4241372	10
263	GRID	1.70E-07	0.00E+00	0.00E+00	601778	4241572	10
1004	BOUNDARY	1.65E-07	0.00E+00	0.00E+00	601844	4241372	10
339	GRID	1.60E-07	0.00E+00	0.00E+00	601878	4241272	10
264	GRID	1.39E-07	0.00E+00	0.00E+00	601878	4241572	10
1005	BOUNDARY	1.39E-07	0.00E+00	0.00E+00	601854	4241372	10
287	GRID	1.35E-07	0.00E+00	0.00E+00	601678	4241472	10
338	GRID	1.30E-07	0.00E+00	0.00E+00	601778	4241272	10
1006	BOUNDARY	1.18E-07	0.00E+00	0.00E+00	601864	4241372	10

## RECEPTORS WITH HIGHEST ACUTE HI

REC	TYPE	CANCER	CHRONIC	ACUTE	UTME	UTMN	ZONE
288	GRID	4.01E-07	0.00E+00	0.00E+00	601778	4241472	10
1000	BOUNDARY	3.32E-07	0.00E+00	0.00E+00	601804	4241372	10
999	BOUNDARY	2.95E-07	0.00E+00	0.00E+00	601794	4241372	10
1001	BOUNDARY	2.91E-07	0.00E+00	0.00E+00	601814	4241372	10
1002	BOUNDARY	2.42E-07	0.00E+00	0.00E+00	601824	4241372	10
289	GRID	2.33E-07	0.00E+00	0.00E+00	601878	4241472	10
1003	BOUNDARY	1.99E-07	0.00E+00	0.00E+00	601834	4241372	10
263	GRID	1.70E-07	0.00E+00	0.00E+00	601778	4241572	10
1004	BOUNDARY	1.65E-07	0.00E+00	0.00E+00	601844	4241372	10
339	GRID	1.60E-07	0.00E+00	0.00E+00	601878	4241272	10
264	GRID	1.39E-07	0.00E+00	0.00E+00	601878	4241572	10
1005	BOUNDARY	1.39E-07	0.00E+00	0.00E+00	601854	4241372	10
287	GRID	1.35E-07	0.00E+00	0.00E+00	601678	4241472	10
338	GRID	1.30E-07	0.00E+00	0.00E+00	601778	4241272	10
1006	BOUNDARY	1.18E-07	0.00E+00	0.00E+00	601864	4241372	10

Rep\_Can\_70yr\_DerOEH\_Rec1106\_AllSrc\_AllCh\_ByRec\_Site

This file:

F:\ENGINEER\Software\HARP\HARP\Projects\2010\C1058\Rep\_Can\_70yr\_DerOEH\_Rec1106\_AllSrc\_AllCh\_ByRec\_Site.txt

Created by HARP Version 1.4b Build 23.08.00

Uses ISC Version 99155

Uses BPIP (Dated: 04112)

Creation date: 2/2/2011 10:09:11 AM

EXCEPTION REPORT

(there have been no changes or exceptions)

INPUT FILES:

Source-Receptor file:

F:\ENGINEER\Software\HARP\HARP\Projects\2010\C1058\C1058.SRC

Averaging period adjustment factors file: not applicable

Emission rates file: database

Site parameters file: F:\ENGINEER\Software\HARP\HARP\Projects\2010\C1058\site.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: 70 year (adult resident)

Analysis method: Derived (OEHHA) Method

Health effect: Cancer Risk

Receptor(s): 1106

Sources(s): All

Chemicals(s): All

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.02

DRINKING WATER

\*\*\* Pathway disabled \*\*\*

FISH

\*\*\* Pathway disabled \*\*\*

PASTURE

\*\*\* Pathway disabled \*\*\*

HOME GROWN PRODUCE

HUMAN INGESTION

Fraction of ingested leafy vegetable  
from home grown source 0.15

Fraction of ingested exposed vegetable  
from home grown source 0.15

Fraction of ingested protected vegetable  
from home grown source 0.15

Fraction of ingested root vegetable  
from home grown source 0.15

PIGS, CHICKENS AND EGGS

Rep\_Can\_70yr\_DerOEH\_Rec1106\_AllSrc\_AllCh\_ByRec\_Site

HUMAN INGESTION

Fraction of ingested pig  
from home grown source 1  
 Fraction of ingested chicken  
from home grown source 1  
 Fraction of ingested egg  
from home grown source 1

ANIMALS' FEED

Fraction of pigs' feed  
from home grown crop 0.1  
 Fraction of chickens' feed  
from home grown crop 0.05

SOIL INGESTION

Fraction of pigs' feed  
eaten off the ground 0.1  
 Fraction of chickens' feed  
eaten off the ground 0.05

PIG FEED COMPOSITION

Fraction of feed that is  
exposed vegetable 0.25  
 Fraction of feed that is  
leafy vegetable 0.25  
 Fraction of feed that is  
protected vegetable 0.25  
 Fraction of feed that is  
root vegetable 0.25

CHICKEN FEED COMPOSITION

Fraction of feed that is  
exposed vegetable 0.25  
 Fraction of feed that is  
leafy vegetable 0.25  
 Fraction of feed that is  
protected vegetable 0.25  
 Fraction of feed that is  
root vegetable 0.25

DERMAL ABSORPTION

\*\*\* Pathway enabled \*\*\*

SOIL INGESTION

\*\*\* Pathway enabled \*\*\*

MOTHER'S MILK

\*\*\* Pathway enabled \*\*\*

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME
0001	1151	PAHs-w/o	BACKGROUND (ug/m <sup>3</sup> )
[Treated as B(a)P for HRA]			PAHs, total, w/o individ. components reported
			0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh)	CancerPF(Oral)
ChronicREL(Inh)		ChronicREL(Oral)	AcuteREL	

	mg/kg-d	Rep_Can_70yr_DerOEH_Rec1106_AllSrc_AllCh_ByRec_Site (mg/kg-d) <sup>-1</sup>	ug/m <sup>3</sup>	(mg/kg-d) <sup>-1</sup>	ug/m <sup>3</sup>
0001	1151 *	PAHs-w/o	*	3.90E+00	1.20E+01
					*

EMISSIONS DATA SOURCE: Emission rates loaded from database  
 CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=5341 DEV=1 PRO=1 STK=1 NAME=RECOLOGY HAY ROAD  
 STACK 1 EMS (lbs/yr)  
 SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m <sup>3</sup> )	AVRG (lbs/yr)
1151	PAHs-w/o	1	0	0.0641
0.000013028				

CANCER RISK REPORT

REC	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY
BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL		
1106	6.23E-10	8.28E-09	1.24E-09	0.00E+00	0.00E+00	0.00E+00	3.03E-08	0.00E+00
0.00E+00	1.51E-12	6.37E-11	1.86E-12	6.71E-11	3.99E-08	4.05E-08		